REMARKS

Claims 2, 4-24, 26 and 28-49 are pending in the present application. No amendments to the claims are made by this Response. Reconsideration of the claims is respectfully requested in view of the following remarks.

I. Alleged Obviousness of Based on Krembs and MacFarlane

The Office Action rejects claims 2 and 26 under 35 U.S.C. § 103(a) as being allegedly obvious in view of Krembs (U.S. Patent No. 3,585,443) and MacFarlane (U.S. Patent No. 5,801,666). This rejection is respectfully traversed.

With regard to claims 2 and 25, the Office Action states:

> As to claims 2 and 26, Krembs teaches a three-dimensional display, comprising:
>
> A three dimensional matrix (5) of light emitting elements capable of generating images in three dimensions (7); and
>
> A base coupled to the three dimensional matrix, the base having electrical circuitry (11) for powering and controlling the three dimensional matrix, wherein the light emitting elements are pixels "the intersection of a plane of glass wires 1 and glass wires 3" and, wherein each include a cell of the intersection of anodized glass wires (1,3) making cubic pixels that would perform as an anode and a cathode; and a gas volume (see figure 1, column 2, liens 10-30).
>
> Krembs fails to teach "wherein each of the pixels has a red light emitting element, a green light emitting element, and a blue light emitting element". However, MacFarlane teaches the physical elements which are arranged in three-dimensional array of voxels (column 2, lines 20-23); red, green, and blue voxels (column 2, lines 61-62). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize red, green, and a blue voxels taught by MacFarlane for Krembs's monochromatic three dimensional display system because this would improve the variety of the color "RGB" image being displayed (column 2, lines 60-64), while fabricating the three dimensional display system with reduced or prevent cross-talk (column 3, lines 8-9 of MacFarlane).

Claim 2, which is representative of claim 26 with regard to similarly recited subject matter, reads as follows:

2. A three dimensional display, comprising:
a three dimensional matrix of light emitting elements capable of generating images in three dimensions; and
a base coupled to the three dimensional matrix, the base having electrical circuitry for powering and controlling the three dimensional matrix, wherein the light emitting elements are pixels, and wherein each of the pixels has a red light emitting element, a green light emitting element, and a blue light emitting element, and wherein the red light emitting element, green light emitting element and blue light emitting element each include a cell having an anode, a cathode, a gas volume and a phosphorus material.

Krembs is directed to a gas filled box having parallel glass planes with embedded wires that are perpendicular to one another. The gas in the box is allowed to circulate freely through the box in order to provide a more uniform distribution of the ionized gas resulting in a more uniform firing potential for each electrode pair (column 2, lines 72-75). Individual wires may be addressed so that a voltage is applied to two of the wires. The point where these two wires cross, the voltages add such that the potential difference between the two wires is greater than a firing potential. This causes a discharge at that point.

Since a single gas is provided in the box, the display of Krembs is monochromatic and cannot have a red light emitting element, a green light emitting element, and a blue light emitting element. Since the Krembs display cannot have the red, green, and blue light emitting elements, the Krembs display cannot have such elements in which each element includes a cell having an anode, a cathode, a gas volume and a phosphorus material. Thus, Krembs does not teach or suggest the light emitting elements recited in independent claims 2 and 26.

MacFarlane does not provide for the deficiencies of Krembs. MacFarlane teaches a three dimensional display device having a three dimensional array of voxels each being connected to a separate optical fiber. Light is transmitted down the optical fiber to the voxel, which is a sphere or polyhedron of a clear, synthetic resin containing a clear dye which takes on a color when energized by a beam or stream of light. In essence, the voxels are phosphorescent filters at the end of the light conductors where the light exits so that it is viewable to a viewer as a particular point of color. MacFarlane does not teach red, green and blue light emitting elements each including a cell having an anode, a

cathode, a gas volume and a phosphorus material. The voxels of MacFarlane do not have an anode, a cathode or a gas volume.

The voxels of MacFarlane do not act as an anode and a cathode. There is no anode or cathode in the voxels of MacFarlane. To the contrary, the ultraviolet light channeled through the conductor, i.e. the optical fiber, energizes the dye in the voxel which causes the voxel to emit light of a particular color of the dye. There is no anode or cathode in the voxels because it is not necessary to have a discharge for energizing the dye in the synthetic resin of the voxel. Thus, while the dye in the material of the voxel may or may not be a phosphorus material, the voxels still do not contain an anode, a cathode or a gas volume.

Thus, neither reference, whether alone or in combination, teaches or suggests that each light emitting element of a three dimensional matrix of light emitting elements includes a red light emitting element, a green light emitting element, and a blue light emitting element. Furthermore, neither reference, whether alone or in combination, teaches or suggests that each of the red, green and blue light emitting elements include a cell having an anode, a cathode, a gas volume and a phosphorus material. Therefore, even if the references were somehow combinable, the result still would not be the invention as recited in claims 2 and 26 since these features would not be present in any alleged combination of Krembs and MacFarlane.

In addition to the above, there is no teaching or suggestion in either of MacFarlane or Krembs for the alleged combination. Again, Krembs is directed to a display device in which a gas is allowed to circulate freely and points of light are created by energizing perpendicular glass enclosed wires which, at a point of crossing, create a discharge that generates a point of light. MacFarlane is directed to a three dimensional arrangement of synthetic resin voxels having optical fibers that channel light to the voxels which are energized by the light and cause the dye in the synthetic resin to fluoresce. It is not at all clear how the two completely different display devices may be combined. The voxels of MacFarlane cannot simply be inserted into the gas filled box of Krembs without destroying the very reason for the configuration of Krembs as taught.

The Office Action alleges that red, green and blue voxels may be used to replace Kremb's monochromatic three dimensional display system because it would improve the

variety of the color image being displayed. In essence, the Office Action is stating that it would be obvious to disregard everything taught in Krembs with the exception of a base and a three dimensional matrix. The alleged motivation to disregard everything in Krembs is to obtain more variety of a color image that is being displayed. One of ordinary skill in the art, being presented only with Krembs and MacFarlane, and without a prior knowledge of Applicant's claimed invention, would not have been motivated to completely disregard the actual teachings of Krembs and replace the majority of the operational components in Krembs with voxels as taught in MacFarlane in order to obtain a color display. To the contrary, if the goal was to get a color three dimensional display, why not just use MacFarlane by itself? MacFarlane already provides a color three dimensional display and thus, there would not be any motivation to completely gut the Krembs device and insert the MacFarlane device into the frame of Krembs.

Thus, one of ordinary skill in the art would not have been motivated to combine Krembs with MacFarlane in the manner alleged by the Office Action. The combination of these references is based on a prior knowledge of Applicant's claimed invention and is completely based on a hindsight reconstruction using Applicant's own disclosure as a guide. Moreover, even if one of ordinary skill in the art were somehow motivated to completely remove all of the operational components of Krembs and replace them with the fiber optic lines and voxels of MacFarlane, the result still would not be the invention as recited in claims 2 and 26 for the reasons previously noted above.

In view of the above, Applicant respectfully submits that neither Krembs nor MacFarlane, either alone or in combination, teach or suggest the features of claims 2 and 26. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 2 and 26 under 35 U.S.C. § 103(a).

II. Alleged Obviousness of Based on Mayer and MacFarlane

The Office Action rejects claims 2, 4-14, 19-24, 26, 28-40 and 45-49[1] under 35 U.S.C. § 103(a) as being allegedly obvious in view of Mayer et al. (U.S. Patent No.

[1] Although the statement of the rejection does not include them, the body of the rejection includes references to claims 15-18 and 41-44.

3,790,849) and MacFarlane (U.S. Patent No. 5,801,666). This rejection is respectfully traversed.

With regard to independent claims 2 and 26, the Office Action states:

> As to claims 2 and 26, Mayer et al teaches a three-dimensional display, comprising:
>
> A three dimensional matrix of light emitting elements capable of generating images in three dimensions; and
>
> A base (12) coupled to the three dimensional matrix, the base having electrical circuitry (108, 126) (column 3, lines 30-50) for powering and controlling the three dimensional matrix, wherein the light emitting elements are pixels "the intersection of glass wires at grids 52, 54, 56" (column 6, lines 1-8); wherein each include a cell (102) the intersection of anodized glass wires at grids 52, 54, 56 making cubic pixels that would perform as an anode and a cathode (column 6, lines 1-29 and column 7, lines 3-11); a gas volume 17, and a phosphorus material (see figure 9, column 6, lines 27-52)
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> Mayer et al fails to teach "wherein each of the pixels has a red light emitting element, a green light emitting element, and a blue light emitting element". However, MacFarlane teaches the physical elements which are arrange in three-dimensional array of voxels (column 2, lines 20-23); red, green, and a blue voxels (column 2, liens 61-62). It would have been obvious to a person of ordinary skill in the art at the time of the invention to utilize red, green, and a blue voxels taught by MacFarlane for Mayer et al's monochromatic three dimensional display because this would improve the variety of color "RGB" image being displayed (column 2, lines 60-64), while fabricating the three dimensional display system with reduce or prevent cross-talk (column 3, lines 8-9 of MacFarlane).

Mayer is directed to a capacitive memory flat panel display. This capacitive memory flat panel display depends on a capacitive memory effect, sometimes called inherent memory, to fire the cells in the device and maintain the display (column 1, lines 33-37 and 48-55). The display device is comprised of a plurality of X and Y direction running conductors that are provided with a dielectric covering and are sandwiched between panels. In this way, rather than having the wires on the outside of the panel and using the panel itself as the dielectric material, the Mayer device permits the wires to be placed inside the panel structure. This eliminates the criticality of the spacing between the panels (column 2, lines 53-68).

Mayer does teach that a plurality of these flat panels may be layered together to generate a three dimensional display device (column 6, lines 27-44). Each grid, i.e. panel within the three dimensional display device, may generate a different color either by using a different gaseous environment or using different phosphors that glow in response to a cell discharge. Mayer further teaches that the conductors may be anodized in order to provide a uniform surface that has no holes in the dielectric coating of the conductors.

Mayer does not teach a three dimensional matrix of light emitting elements wherein each element is a pixel that has a red, green and blue light emitting element and wherein each of the red, green and blue light emitting elements include a cell having an anode, a cathode, a gas volume and a phosphorus material, as recited in claims 2 and 26. Mayer actually teaches that each panel in the three dimensional embodiment may emit a different color by using different gases or different phosphors. Mayer does not teach that each pixel of a three dimensional display includes a red, green and blue light emitting element that each include a cell having an anode, a cathode, a gas volume and a phosphorus material. To the contrary, each "pixel" in the Mayer three dimensional embodiment has a single color as is recognized by the Office Action's admission that the panels in Mayer are monochromatic.

The Office Action further admits that Mayer does not teach that each pixel has a red light emitting element, a green light emitting element, and a blue light emitting element, and wherein the red light emitting element, green light emitting element, and blue light emitting element each include a cell having an anode, a cathode, a gas volume and a phosphorus material. The Office Action alleges, however, that MacFarlane teaches such features.

The teachings of MacFarlane have been discussed previously. While MacFarlane may teach that the voxels may be energized to emit different points of color, there is no teaching or suggestion in MacFarlane that these voxels include an anode, a cathode, and a gas volume. To the contrary, as stated above, the voxels are simply a resin that may be doped with a dye that fluoresces when energized by ultraviolet light. They do not include an anode, a cathode or a gas volume.

Moreover, there is no teaching or suggestion in MacFarlane to include a red, green and blue voxel for each light emitting element of a three dimensional display of

light emitting elements. To the contrary, MacFarlane merely teaches a three dimensional array of voxels. Each voxel itself would serve as a light emitting element in the three dimensional array, i.e. a pixel, and thus, each "pixel" in MacFarlane has a single color. There is no teaching or suggestion in MacFarlane to have a red, green and blue light emitting element for each pixel in a three dimensional array of pixels. Thus, MacFarlane does not teach or suggest a three dimensional matrix of light emitting elements, wherein each light emitting element is a pixel having a red, green and a blue light emitting element, and wherein each of the red, green and blue light emitting elements include a cell having an anode, a cathode, a gas volume and a phosphorus material.

Since neither reference teaches or suggests these features, any alleged combination of these references, assuming one were somehow able to combine the teachings of these references and were motivated to do so, would still not result in the invention as recited in claims 2 and 26. That is, any alleged combination of Mayer and MacFarlane would still not result in the invention recited in claims 2 and 26 since the combination still would not include a three dimensional matrix of light emitting elements, wherein each light emitting element is a pixel having a red, green and a blue light emitting element, and wherein each of the red, green and blue light emitting elements include a cell having an anode, a cathode, a gas volume and a phosphorus material.

Furthermore, the Mayer and MacFarlane teachings are not combinable in the manner alleged by the Office Action. The Mayer reference is similar to the gas-filled box of Krembs, and is directed to a gas-filled panel having conductors place within the gas-filled panel. MacFarlane is directed to an array of voxels that are energized by ultraviolet light conducted by fiber-optic lines. The two structures are completely different and cannot be used interchangeably despite the allegations made by the Office Action. Because these two display structures operate in very different ways, it is not possible simply to replace certain elements of one reference with those of the other without destroying the functionality of one or both of the display devices described in the references. For example, one could not simply replace the "cells" in Mayer with the voxels in MacFarlane without destroying the operation of the gas-filled panels in Mayer. Similarly, one could not replace the voxels in MacFarlane with the "cells" in Mayer since it would destroy the fiber-optic/voxel based design of MacFarlane. The two devices

simply are not compatible or usable with each other. While they are both generally directed to display devices, the structures and operation of these display devices render them in non-analogous art categories.

In addition to the above, one of ordinary skill in the art, being presented only with Mayer and MacFarlane, and without having a prior knowledge of Applicant's claimed invention, would not have been motivated to combine the references and modify them in the manner necessary to arrive at the claimed invention. The Office Action again alleges that the motivation to combine the references is to provide a color display while reducing or preventing cross-talk. This is already achieved by the display of MacFarlane and there would be no need to combine MacFarlane with Mayer to achieve such a purpose. In actuality, because the structures and operation of the two display devices are so different from one another, one of ordinary skill in the art would not know where to begin at trying to combine MacFarlane with Mayer because they are incompatible. It is not at all clear how one could take a three dimensional array of voxels energized by ultraviolet light conducted by fiber-optic lines, combine them with gas-filled panels having grids of conductors with dielectric covers, and achieve an operational display device. Moreover, it is not at all clear how one would then modify such a combined display device to arrive at the three dimensional display device recited in claims 2 and 26.

The only motivation to even try and attempt such a combination is based completely on a hindsight reconstruction of Applicant's invention having first had benefit of Applicant's disclosure. One of ordinary skill in the art would not have taken it upon themselves to try and create a three dimensional display having a three dimensional matrix of light emitting elements, wherein each light emitting element is a pixel having a red, green, and blue light emitting element and wherein each of the red, green and blue light emitting elements include a cell having an anode, a cathode, a gas volume and a phosphorus material, based on the teachings of Mayer and MacFarlane unless they first had benefit of Applicant's disclosure and the sole purpose of trying to recreate Applicant's claimed invention from the teachings of Mayer and MacFarlane. This is clearly hindsight reconstruction using Applicant's own disclosure as a guide.

Thus, in view of the above, Applicant respectfully submits that neither Mayer nor MacFarlane, either alone or in combination, teach or suggest the features of independent

claims 2 and 26. At least by virtue of their dependency on claims 2 and 26, neither Mayer nor MacFarlane, either alone or in combination, teach or suggest the features of dependent claims 4-24 and 28-49. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 2, 4-14, 19-24, 26, 28-40 and 45-49 under 35 U.S.C. § 103(a).

In addition to the above, neither Mayer nor MacFarlane, either alone or in combination, teaches or suggests the specific features of dependent claims 4-24 and 28-49. For example, with regard to claims 4 and 29, neither reference teaches or suggest that the red light emitting element, green light emitting element, and blue light emitting element each have an anode and a cathode. With regard to these claims, the Office Action states that Mayer teaches an intersection of anodized glass wires that would allegedly perform as an anode and a cathode and that MacFarlane teaches red, green and blue voxels. However, nowhere in either reference is it taught that each of a red, green and blue light emitting element of a pixel in a three dimensional array of pixels have their own anode and cathode.

Regarding claims 5, 6, 28 and 30, neither Mayer nor MacFarlane, either alone or in combination, teaches or suggests that a cathode of one of the pixels is shared by one or more other pixels or an anode of one of the pixels is shared by at least one other pixel. The Office Action alleges that such a feature is a matter of design choice and cites *In re Japikse*, 86 USPQ 70 (CCPA 1950) as stating that relocation of a well-known element is normally not directed toward patentable subject matter. Applicant respectfully disagrees.

In the present case, the sharing of a cathode and an anode is not merely a matter of design choice but is a feature that is of importance to the overall structure and operation of the three dimensional display. By sharing an anode or a cathode, cells may be more closely packed with one another and may be arranged in different geometrical configurations. The sharing of a cathode or an anode is not akin to simply reciting "wherein the light is orange" or "wherein the font is Times New Roman" which would be a design choice since the operation and structure of the underlying device is the same. To the contrary, these features define a specific structure that has importance to structure and operation of the presently claimed invention that is not taught or suggested by any of the cited art.

In the *In re Japikse* case, claims to a hydraulic power press which read on the prior art except with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch would not have modified the operation of the device. In a similar case, *In re Kuhle*, 526 F.2d 553, 188 USPQ 7 (CCPA 1975) the particular placement of a contact in a conductivity measuring device was held to be an obvious matter of design choice. The present case is not the same as those above in that the sharing of a cathode or anode in the presently claimed invention provides a different structure and operation than if the anode or cathode were not shared. That is, the same structural configuration of pixels would not be achievable and the same operation of the three dimensional display device would not be achieved if the anode or cathode were not shared. "The mere fact that a worker in the art could rearrange the parts of the reference device to meet the terms of the claims on appeal is not by itself sufficient to support a finding of obviousness. The prior art must provide a motivation or reason for the worker in the art, without the benefit of appellant's specification, to make the necessary changes in the reference device." *Ex parte Chicago Rawhide Mfg. Co.*, 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984). In the present case, there is no teaching or suggestion in either reference that would lead one of ordinary skill in the art to rearrange any parts in the references such that either an anode or a cathode were shared between pixels of a three dimensional display device.

Similar reasoning applies to the features of claims 7 and 32. Neither reference teaches or suggests that a top face of a pixel is the bottom face of a neighboring pixel or that the side of the pixel is the side of another neighboring pixel. These claims are directed to a specific structural arrangement of pixels to generate a three dimensional display device. This structural arrangement is an important feature for achieving an actual three dimensional image using the three dimensional display device of claims 7 and 32. This structural arrangement is not a matter or design choice and cannot simply be disregarded as such. Moreover, neither reference teaches or suggests such features and cannot be modified to include such features.

Regarding claims 8 and 33, neither reference teaches or suggests that the electrical connections between the pixels, signal sources and power sources are position in seams between pixels. The Office Action alleges that this is taught by elements 108

and 126 of Mayer and at column 3, lines 30-50. Elements 108 and 126 refer to the drive circuitry that is external to the panel in Mayer and thus, cannot be in the seams between pixels in Mayer. Moreover, there is nothing in column 3, lines 30-50 that even mentions seams between pixels or even pixels. To the contrary, all that is taught is a grid of X and Y direction running conductors that are driven by the externally located drive circuitry. There is not even the mention of a seam anywhere in the Mayer reference.

With regard to claims 9, 34 and 35 neither reference teaches or suggests an anode bus line or cathode line being positioned in a seam from an anode/cathode of one pixel to the anode/cathode of another pixel, respectively. The Office Action alleges that Mayer teaches these features because Mayer teaches the intersection of anodized glass wires. Anodized glass wires have nothing to do with an anode bus line or a cathode line being positioned in a seam from the anode/cathode of one pixel to the anode/cathode of another pixel. As mentioned above, there is not so much as a single mention of a seam anywhere in the Mayer reference. Similarly, there is no mention of an anode bus line, or a cathode line. All that is taught in Mayer is a grid of conductors. The Office Action has simply failed to find this feature in any of the references and has failed to establish a prima facie case of obviousness with regard to claims 9, 34 and 35.

With regard to claims 10-12 and 36-38, neither reference teaches or suggests the connection between two anodes of a same colored light emitting element of a two pixels in the three dimensional matrix along a seam. The Office Action again states that these features are taught merely because Mayer teaches the intersection of anodized glass wires. Again, this does not render obvious the specific features of having two anodes of the same colored light emitting elements of two pixels in a three dimensional matrix being by a straight line bus connection along a seam. The Office Action simply has not found this feature and has not established a prima facie case of obviousness with regard to claims 10-12 and 36-38. Nowhere has the Office Action shown where Mayer teaches two red, blue or green light emitting elements of two pixels having their anodes connected by a straight line bus connection along a seam. Similar arguments apply to the features of claims 13 and 39 with regard to a first cathode and a second cathode being connected by a straight line connection along a seam.

With regard to claims 15-18 and 41-44, neither reference teaches or suggests the spacing between anodes/cathodes specifically recited in each of these claims. Rather than actually finding this feature, the Office Action disregards these features as merely design choice. First, neither reference even teaches a pixel having sides and thus, it is not at all clear how one could, as a matter of design choice, arrange the elements of the Mayer or MacFarlane reference such that the distance between anodes/cathodes is twice the length of one side of a pixel. Second, this spacing of anodes/cathodes is not merely a design choice but is a specific structural limitation that cannot simply be disregarded in the manner that it was in the Office Action. As stated on page 15 of the present specification, this features is used so as to simplify "the calculation necessary to determine signal strength and the specific charges needed for a desired cell output." This is not mere design choice.

Regarding claims 21 and 46, neither reference teaches or suggests that the input image is coded in a three dimensional coordinate system. The Office Action alleges that these features are taught by MacFarlane in that MacFarlane teaches specific voxels being selected for activation by a switching network, a computer being associated with a storage medium that may control the switching network, as well as other components. The features of a control system receiving input images coded in a three dimensional coordinate system, as recited in claims 21 and 46 is not obviated simply because there is a switching network in MacFarlane. Nowhere in MacFarlane or Mayer is it taught that the input is coded in a three dimensional coordinate system and the Office Action has failed to point to any specific teaching to this effect in any of the references.

Thus, in addition to being dependent on independent claims 2 and 26, dependent claims 4-24 and 28-49 are also allowable over the alleged combination of Mayer and MacFarlane based on the specific features recited in these claims. Accordingly, Applicant respectfully requests withdrawal of the rejection of claims 4-24 and 28-49 under 35 U.S.C. § 103(a).

III. Conclusion

It is respectfully urged that the subject application is now in condition for allowance. The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

Respectfully submitted,

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